Trend Study 5-9-01

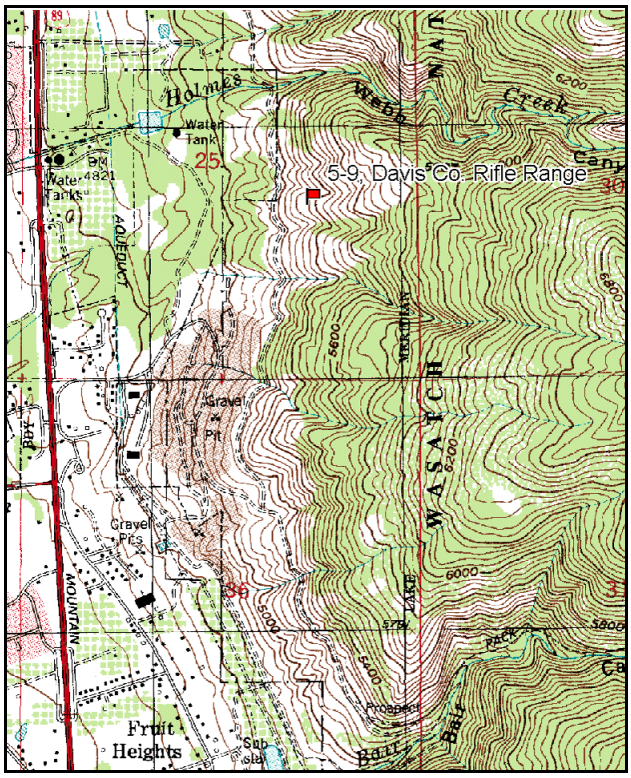
Study site name: Davis Co. Rifle Range . Vegetation type: Bitterbrush .

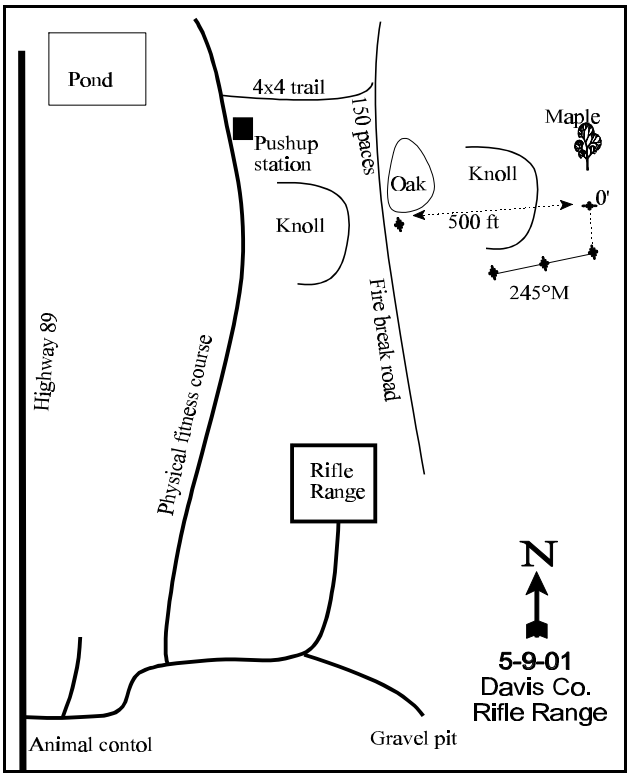
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (59 ft), line 3 (34 ft & 71ft).

LOCATION DESCRIPTION

Take Highway 89 into Davis County. Turn east up the road toward the Animal Control and the Davis County Rifle Range. Go east past the Animal Control Center to a dirt road marked "Par Course". Follow this road 0.45 miles north to a well-developed trial going east. Walk up the trail to a fire break road, the follow the fire break road south 150 paces to a rebar witness post 10 feet south of an oak clone. From the witness post, head due east 500 feet up a bare ridge, then across to a lone maple. A rebar tagged #7081 marks the 0-foot baseline. The baseline doglegs west (245 degrees magnetic) after 100 feet.





Map Name: Kaysville

Diagrammatic Sketch

Township 4N , Range 1W , Section 25

UTM 4544690 N 424627 E

DISCUSSION

Trend Study No. 5-9

The Davis County Rifle Range trend study is located on a slope above gravel pits and the Davis County Rifle range. This transect samples an area of open, mixed brush range. The 40% slope has a western exposure with an elevation of 5,600 feet. Like other Forest Service land along the Wasatch Front, livestock grazing has been discontinued in order to protect the watershed values. Although there are many roads, the distance to housing developments is greater here than other transects along the Wasatch Front. Therefore, human pressure is relatively low. Deer pellet groups were very abundant in 1985 and 1990. A pellet group transect read on the site in 2001 estimated 67 deer use days/acre (165 ddu/ha). Most of the deer pellet groups appear to be from late winter use with some from early spring. Some coyote scat was seen on site but not encountered within the pellet group transect.

The soil is in the highly erosion-susceptible Ridd series (USDA 1968). It is underlain by bedrock at a depth of 25 to 40 inches. Effective rooting depth was estimated at 37 inches in 2001. The soil is a rocky sandy loam with a majority of the surface protected by vegetation, litter and a buildup of organic matter. Some erosion is apparent in the form of pedestalling of soil around shrubs, flow patterns, rills, and some localized soil movement. The erosion condition class was determined as slight in 2001.

Moderate quantities of quality browse forage are available on this slope. Antelope bitterbrush dominates the browse component by providing 68% of the browse cover in 2001. It is highly preferred and displayed heavy hedging in 1985. Utilization was moderate to heavy in 1990 and 2001. The plants are large and vigorous and there was adequate regeneration during past readings but no seedlings or young were encountered in 2001.

Mountain big sagebrush is moderately abundant but produces only 24% of the browse cover with an average cover value of 6% in 2001. The population was moderate to heavily browsed in 1985. It displayed poor vigor on 18% of the plants sampled and percent decadence was high at 41%. Utilization has been light since and vigor improved. The only other browse sampled includes small numbers of Wyeth eriogonum, broom snakeweed, and prickly pear cactus.

The herbaceous understory is dominated by cheatgrass which provided nearly half (46%) of the grass cover. The low value perennial, bulbous bluegrass is also abundant. It produces an average of 14% cover. Preferred perennial grasses occur in low numbers, with mutton bluegrass and bluebunch wheatgrass being the most common.

Forbs are diverse and moderately abundant. However, composition is poor with annuals providing 83% of the forb cover in 2001. The most abundant annual is storksbill which currently provides 80% of the forb cover. The only common perennial is the weedy yellow salsify. Utilization of all herbaceous species is generally light.

1985 APPARENT TREND ASSESSMENT

As with many locations along the Wasatch Front, there appears to be a slow decline in the browse component of each community. The grasses are lightly utilized and increasing faster than the slow-reproducing sagebrush and bitterbrush. The soil is relatively stable.

1990 TREND ASSESSMENT

The data comparisons from this site illustrate the slow decline of browse, especially big sagebrush, found in most places along the Wasatch Front. The mountain big sagebrush has decreased in density. Sagebrush canopy cover averages 2%. However, vigor is fair and recent lighter use has resulted in lightly hedged growth forms on the mature plants. Young plants of sagebrush and bitterbrush were found. The bitterbrush is more heavily hedged and it has declined slightly in density. It remains to be seen if the young plants can replace the steady loss of older shrubs on this moderately to heavily used winter range. There is competition in the understory from the abundant cheatgrass and small bluegrasses. As in 1985, yellow salsify is the only common perennial forb. Litter cover is high due to the abundance of annuals. Considerable soil movement occurs on the 40% slope. Active gullies cross the site.

TREND ASSESSMENT
soil - stable but poor (3)
browse - down slightly (2)
herbaceous understory - stable, but dominated by annuals (3)

2001 TREND ASSESSMENT

Trend for soil is stable. Percent cover for bare ground declined slightly but litter cover also declined. There is adequate protective ground cover on the site to prevent most erosion. Some erosion is inevitable considering the terrain. Trend for the key browse, bitterbrush and mountain big sagebrush is up slightly for sagebrush and stable for bitterbrush. Sagebrush has increased slightly in density and displays a decline in percent decadence. Reproduction is poor but young plants currently account for 8% of the population. Bitterbrush remains at a similar density. Utilization remains moderate to heavy but vigor is good and percent decadence has declined to only 8%. Annual leader growth averages 2 inches which is nearly an inch below the unit average. Recruitment is poor with no young plants sampled. Dry conditions combined with competition from the weedy understory are likely having a negative effect of seedling establishment. However, these are long lived plants and a return to normal precipitation patterns could reverse this trend. Overall, the browse trend is considered stable. Trend for the herbaceous understory is down slightly. Sum of nested frequency of perennials has increased slightly but the increase comes primarily from bulbous bluegrass, a low value increaser. Cheatgrass, bulbous bluegrass, and the annual forb storksbill totally dominate the herbaceous understory by providing 86% of the total herbaceous cover. Nested frequency of mutton bluegrass, the most abundant preferred perennial, declined significantly. Bluebunch wheatgrass also declined in nested frequency.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - down slightly and dominated by annuals (2)

HERBACEOUS TRENDS --
Herd unit 05 , Study no: 9

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'85	'90	'01	'85	'90	'01	'01
G	Agropyron spicatum	28	38	27	11	17	14	1.51
G	Bromus brizaeformis (a)	-	-	25	-	-	10	.12
G	Bromus tectorum (a)	-	-	293	-	-	88	15.16
G	Carex spp.	-	-	3	-	-	1	.03
G	Festuca myuros (a)	-	-	6	-	-	2	.03
G	Poa bulbosa	$_{a}$58	$_{b}$136	$_{c}$222	20	48	69	13.56
G	Poa secunda	$_{c}$202	$_{b}$118	$_{a}$84	70	50	28	2.18
Total for Annual Grasses		0	0	324	0	0	100	15.32
Total for Perennial Grasses		288	292	336	101	115	112	17.30
Total for Grasses		288	292	660	101	115	212	32.62
F	Agoseris glauca	$_{b}$25	$_{a}$-	$_{a}$3	13	-	1	.00
F	Alyssum alyssoides (a)	-	-	47	-	-	21	.11
F	Allium spp.	$_{b}$35	$_{a}$-	$_{a}$11	18	-	4	.05
F	Astragalus spp.	5	-	-	3	-	-	-
F	Cirsium undulatum	3	5	10	1	3	4	.36
F	Collomia linearis (a)	-	-	1	-	-	1	.00
F	Crepis acuminata	$_{b}$10	$_{a}$2	$_{ab}$8	7	2	4	.15
F	Cymopterus spp.	33	16	12	14	7	6	.10
F	Epilobium brachycarpum (a)	$_{b}$112	-	$_{a}$12	47	-	5	.02
F	Erigeron caespitosus	3	-	-	1	-	-	-
F	Erodium cicutarium (a)	$_{a}$10	-	$_{b}$194	5	-	64	7.44
F	Hackelia patens	-	-	3	-	-	1	.03
F	Holosteum umbellatum (a)	-	-	60	-	-	23	.17
F	Larrea divaricata	-	-	3	-	-	2	.03
F	Lomatium spp.	-	-	4	-	-	3	.05
F	Polygonum douglasii (a)	-	-	7	-	-	3	.01
F	Tragopogon dubius	$_{b}$146	$_{a}$51	$_{a}$44	65	25	18	.75
F	Unknown forb-perennial	3	-	-	1	-	-	-
Total for Annual Forbs		122	0	321	52	0	117	7.76
Total for Perennial Forbs		263	74	98	123	37	43	1.55
Total for Forbs		385	74	419	175	37	160	9.31

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 05 , Study no: 9

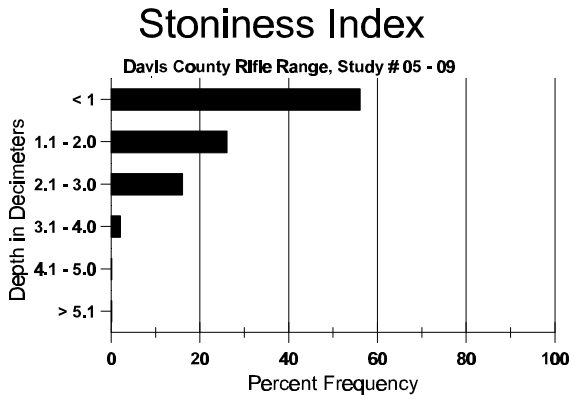
Type	Species	Strip Frequency '01	Average Cover % '01
B	Artemisia tridentata vaseyana	33	6.01
B	Eriogonum heracleoides	7	.79
B	Gutierrezia sarothrae	14	1.24
B	Opuntia polyacantha	2	.00
B	Purshia tridentata	26	16.82
B	Quercus gambelii	0	.03
Total for Browse		82	24.90

BASIC COVER --
Herd unit 05 , Study no: 9

Cover Type	Nested Frequency '01	Average Cover % '85	'90	'01
Vegetation	386	9.50	4.75	63.66
Rock	87	3.25	1.75	2.98
Pavement	166	11.75	12.00	8.18
Litter	374	53.50	73.25	53.75
Cryptogams	1	0	.50	.00
Bare Ground	111	22.00	7.75	4.78

SOIL ANALYSIS DATA --
Herd Unit 05, Study no: 09, Davis County Rifle Range

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
37.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A



PELLET GROUP FREQUENCY --
Herd unit 05 , Study no: 9

Type	Quadrat Frequency	Pellet Transect	
		Pellet Groups per Acre	Days Use per Acre (ha)
	'01	'01	'01
Rabbit	4	26	N/A
Deer	13	870	67 (165)

BROWSE CHARACTERISTICS --
Herd unit 05 , Study no: 9

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	85	2	1	-	-	-	-	-	-	-	2	-	1	-	200			3
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	01	3	-	-	1	-	-	-	-	-	4	-	-	-	80			4
M	85	4	2	1	-	-	-	-	-	-	7	-	-	-	466	24	26	7
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266	16	26	4
	01	41	4	-	1	-	-	-	-	-	46	-	-	-	920	21	33	46
D	85	-	4	3	-	-	-	-	-	-	5	-	2	-	466			7
	90	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	01	3	-	-	-	-	-	-	-	-	2	-	-	1	60			3
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	41%	24%	18%	-30%
'90	00%	00%	00%	+25%
'01	08%	00%	02%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	1132	Dec:	41%
	'90	798		33%
	'01	1060		6%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Eriogonum heracleoides																		
Y	85	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	2	-	-	-	-	-	-	-	-	2	-	-	-	133	10	13	2
	90	3	-	-	-	-	-	-	-	-	3	-	-	-	200	7	17	3
	01	8	-	-	1	-	-	-	-	-	8	1	-	-	180	8	16	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	+ 0%
'90	00%	00%	00%	-32%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'85	266	Dec:		-
'90	266			-
'01	180			-

Gutierrezia sarothrae																		
S	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	90	10	-	-	-	-	-	-	-	-	10	-	-	-	666			10
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	85	11	-	-	-	-	-	-	-	-	9	2	-	-	733			11
	90	11	-	-	-	-	-	-	-	-	11	-	-	-	733			11
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	20	-	-	-	-	-	-	-	-	16	4	-	-	1333	11	13	20
	90	11	-	-	-	-	-	-	-	-	11	-	-	-	733	12	20	11
	01	18	1	-	-	-	-	-	-	-	19	-	-	-	380	13	19	19
D	85	1	-	-	-	-	-	-	-	-	-	-	1	-	66			1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	3	-	-	-	-	-	-	-	-	2	-	-	1	60			3
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	580			29

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	03%	-31%
'90	00%	00%	00%	-70%
'01	05%	00%	05%	

Total Plants/Acre (excluding Dead & Seedlings)				
'85	2132	Dec:		3%
'90	1466			0%
'01	440			14%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	23	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	
'90	00%	00%	00%	
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'90	0		-
	'01	0		-

Opuntia polyacantha																		
M	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200	8	10	3
	90	2	-	-	-	-	-	-	-	-	2	-	-	-	133	7	10	2
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60	9	19	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	00%	00%	00%	-34%
'90	00%	00%	00%	-55%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	200	Dec:	-
	'90	133		-
	'01	60		-

Purshia tridentata																		
Y	85	1	3	1	-	-	-	-	-	-	5	-	-	-	333			5
	90	4	1	-	-	-	-	-	-	-	5	-	-	-	333			5
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	-	-	15	-	-	-	-	-	-	15	-	-	-	1000	43	24	15
	90	2	4	-	-	-	-	-	-	-	6	-	-	-	400	45	43	6
	01	15	15	3	-	1	1	-	-	-	35	-	-	-	700	41	84	35
D	85	-	-	3	-	-	-	-	-	-	-	-	3	-	200			3
	90	-	-	2	-	-	-	-	-	-	2	-	-	-	133			2
	01	-	2	1	-	-	-	-	-	-	3	-	-	-	60			3
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'85	13%	83%	13%	-44%
'90	38%	15%	00%	-12%
'01	47%	13%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	1533	Dec:	13%
	'90	866		15%
	'01	760		8%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Quercus gambelii																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	36	37	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'85	00%	00%	00%
'90	00%	00%	00%
'01	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'85	0	Dec:	-
	'90	0		-
	'01	0		-